CLAIMS

What is claimed is:

1. A method, comprising:

downconverting a beam of coherent energy to provide a beam of multi-color entangled photons;

converging two spatially resolved portions of the beam of multi-color entangled photons into a converged multi-color entangled photon beam;

changing a phase of at least a portion of the converged multi-color entangled photon beam to generate a first interferometeric multi-color entangled photon beam; and

combining the first interferometric multi-color entangled photon beam with a second interferometric multi-color entangled photon beam within a single beamsplitter.

2. The method of claim 1, wherein the first interferometic multi-color entangle photon beam and the second interferometric multi-color entangled photon beam are combined within a single interference zone within the single beam splitter.

3. The method of claim 1, wherein combining includes erasing energy and momentum characteristics from both the first interferometric multi-color entangled photon beam and the second interferometric multi-color entangled photon beam.

4. The method of claim 1, further comprising, after combining, splitting the first interferometric multi-color entangle photon beam and the second interferometric multi-color entangled photon beam within the single beamsplitter.

5. The method of claim 4, wherein splitting yields a first output beam of multi-color entangled photons and a second output beam of multi-color entangled photons.

6. The method of claim 5, further comprising:

splitting the first output beam of multi-color entangled photons into a first component multi-color photon beam and a second component multi-color photon beam; and

splitting the second output beam of multi-color entangled photons into a third component multi-color photon beam and a fourth component multi-color photon beam.

7. The method of claim 6, further comprising:

detecting a first characteristic of the first component multi-color photon beam;

detecting a second characteristic of the second component multi-color photon beam;

detecting a third characteristic of the third component multi-color photon beam; and

detecting a fourth characteristic of the fourth component multi-color photon beam.

8. The method of claim 5, further comprising:

shading the first output beam of multi-color entangled photons with a first energy position defining slit; and

shading the second output beam of multi-color entangled photons with a second energy position defining slit.

9. A computer program, comprising computer or machine readable program elements translatable for implementing the method of claim 1.

10. An electromagnetic waveform produced by the method of claim 1.

11. An electronic media, comprising a program for performing the method of claim 1.

12. An apparatus, comprising the electronic media of claim 11.

13. An apparatus, comprising:

a multi-refringent device optically coupled to a source of coherent energy, the multi-refringent device providing a beam of multi-color entangled photons;

a condenser device optically coupled to the multi-refringent device, the condenser

device converging two spatially resolved portions of the beam of multi-color entangled photons into a converged multi-color entangled photon beam;

a tunable phase adjuster optically coupled to the condenser device, the tunable phase adjuster changing a phase of at least a portion of the converged multi-color entangled photon beam to generate a first interferometeric multi-color entangled photon beam; and

a beam splitter optically coupled to the condenser device, the beam splitter combining the first interferometeric multi-color entangled photon beam with a second interferometric multi-color entangled photon beam.

14. The apparatus of claim 13, wherein the condenser device includes a mirror and a mixer.

15. The apparatus of claim 13, further comprising another condenser device optically coupled to the multi-refringent crystal, the another condenser device converging two spatially resolved portions of another beam of multi-color entangled photons into another converged multi-color entangled photon beam.

16. The apparatus of claim 15, further comprising a fixed phase adjuster optically coupled between the another condenser device and the beam splitter, the fixed phase adjuster generating the second interferometric multi-color entangled photon beam.

17. The apparatus of claim 13, wherein the multi-refringent device includes a non-linear optical crystal.

18. The apparatus of claim 17, wherein the non-linear optical crystal includes a bi-refringent crystal.

19. The apparatus of claim 17, wherein the non-linear optical crystal includes at least one member selected from the group consisting of LiB_3O_5, KH_2PO_4, KD_2PO_4, $NH_4H_2PO_4$, β-BaB_2O_4, $LiIO_3$, $KTiOPO_4$, $LiNbO_3$, $KnbO_3$, $AgGaS_2$, $ZnGeP_2$, $KB_5O_8 - 4H_2O$, $CO(NH_2)_2$,

CsH_2AsO_4, CsD_2AsO_4, $KTiOAsO_4$, $MgO : LiNbO_3$, Ag_3AsS_3, GaSe, $AgGaSe_2$, CdSe, $CdGeAs_2$, $KB_5O_8 - 4D_2O$, CsB_3O_5, $BeSO_4 - 4D_2O$, $MgBaF_4$, $NH_4D_2PO_4$, RbH_2Po_4, RbD_2PO_4, KH_2AsO_4, $NH_4H_2AsO_4$, $NH_4D_2AsO_4$, RbH_2AsO_4, RbD_2AsO_4, $LiCOOH - H_2O$, NaCOOH, $Ba(COOH)_2$, $Sr(COOH)_2$, $Sr(COOH)_2 \cdot 2H_2O$, $LiGaO_2$, α-HIO_3, $K_2La(NO_3)_5 \cdot 2H_2O$, $CsTiOAsO_4$, $NaNO_2$, $Ba_2NaNb_5O_{15}$, $K_2Ce(NO_3)_5 \cdot 2H_2O$, $K_3Li_2Nb_5O_{15}$, $HgGa_2S_4$, HgS, Ag_3SbS_3, Se, Tl_3AsS_3, Te, $C_{12}H_{22}O_{11}$, L-Arginine Phosphate Monohydrate, Deuterated L-Arginine Phosphate Monohydrate, L-Pyrrolidone-2-Carboxylic Acid, $CaC_4H_4O_6 \cdot 4H_2O$, $(NH_4)_2C_2O_4 \cdot H_2O$, m-Bis(amonimethyl)benzene, 3-Methoxy-4hydroxy-benzaldehyde, 2-Furyl Methacrylic Anhydride, 3-Methyl-4-nitropyridine-1-oxide, Thienylchalcone, 5-Nitrouracil, 2-(N-Prolinol-5-nitropyridine), 2-Cyclooctylamino-5-nitropyridine, L-N-(5-Nitro-2-pyridyl) leucinol, $C_6H_4(NO_2)_2$ (m-Dinitrobenzene), 4-(N,N-Dimethylamino)-3-acetaminonitrobenzene, Methyl-(2,4-dinitrophenyl)-aminopropanoate, m-Nitroaniline, N-(4-Nitrophenyl-N-methylaminoacetonitrile, N-(4-Nitrophenyl)-L-prolinol, 3-Methyl-4-methoxy-4-nitrostilbene, and α-SiO_2.

20. The apparatus of claim 13, further comprising:
a first energy position defining slit optically coupled to the beam splitter; and
a second energy position defining slit also optically coupled to the beam splitter.

21. The apparatus of claim 20, further comprising:
a first optical separator optically coupled to the first energy position defining slit; and
a second optical separator optically coupled to the second energy position defining slit.

22. The apparatus of claim 21, wherein the first optical separator includes at least one member selected from the group consisting of a cold mirror and a cold filter.

23. The apparatus of claim 21, wherein the second optical separator includes at least one member selected from the group consisting of a cold mirror and a cold filter.

24. The apparatus of claim 21, further comprising:

a first optical detector optically coupled to the first optical separator;

a second optical detector also optically coupled to the first optical separator;

a third optical detector optically coupled to the second optical separator; and

a fourth optical detector also optically coupled to the second optical separator

25. The apparatus of claim 24, further comprising:

a signal processing unit optically coupled to the first optical detector, the second optical detector, the third optical detector and the fourth optical detector;

a computer program, running on the signal processing unit; and

a graphical user interface coupled to the signal processing unit.

26. The apparatus of claim 13, further comprising the source of coherent energy.

27. The apparatus of claim 26, further comprising a converging lens optically coupled between the source of coherent energy and the multi-refringent device.